

# PC104-CTR10HD



## Features

Two 5 Channel 16 Bit Counter/Timers  
9513  
Up to 7MHz Inputs  
10 Counters Total on Board  
Programmable Clock Source  
Programmable to Interrupt PC 2-7  
Single High Density 50 Pin Connector

## DESCRIPTION

The PC104-CTR10HD provides a pair of high performance AM9513 based counter/timer chips and supporting circuitry on a PC104 bus expansion board.

Each 9513 provides five counters with 16 bit (65,536 count) registers. The 9513 is an extremely powerful and flexible component which is software programmable for event counting, pulse & frequency measurement, alarm comparator and other input functions. As an output device the 9513 can generate frequencies with complex duty cycles and provide one shot and continuous outputs.

The board utilizes a high density 50 pin header type connector each carrying 10 complete sets of counter Gate, Input, Output and counter chip control signals provide for counter intensive applications.

## PROGRAMMABLE COUNTER CHAINING

The 9513 counters one through five may be chained via software, enabling a 32, 48, 64 or 80 bit counter to be constructed within the chip. In addition the gate source and gating functions are software programmable and may be reconfigured as counter inputs. Chaining across chips is possible with a single wire allowing the construction of up to 160 bit counters. As a point of interest, at 1MHz, a 160 bit counter would take  $4.63 \times 10^{34}$  years to reach terminal count. The UniversalLibrary is the best choice for programming the PC104-CTR10HD from any DOS or Windows language.

## PROGRAMMABLE COUNTER SOURCE

The source of pulses to the 9513 is fully programmable. Three sources are available. These are External, 1MHz or 5MHz. The counter source is controlled by a register at base + 400. The default counter source (power up or reset) is 1MHz, which is compatible with the very popular ISA bus card, the CIO-CTR05.

## PROGRAMMABLE INTERRUPT LEVEL

An external interrupt input pin provides access to the personal computer interrupts 2-7. The interrupt selected (or none) is set in the register at Base + 400. Once an interrupt level is selected, a rising edge on the IR INPUT ( pin 26) will cause a PC IRQ, which will branch program control to that IRQ handler.

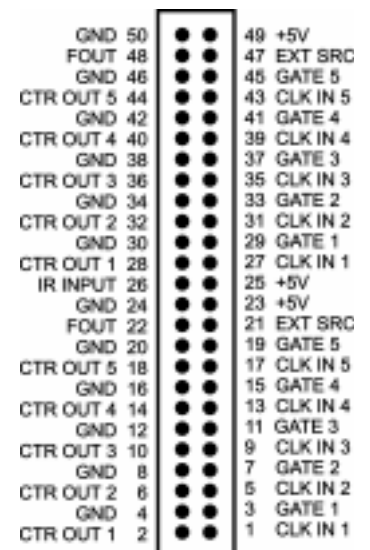
## CABLING & SIGNAL CONNECTION

Counter intensive applications benefit from the 10 counters on a single high density 50 pin connector.

Cabling to the PC104-CTR10HD is via a standard 50 pin header type connector.

The cable carries all counter inputs, outputs and gates for two 9513s, the interrupt input, +5 volts and ground.

You may notice two sets of signals with identical names on the diagram to the right. The lower set belongs to the 9513 at base + 0, the upper to base + 2.



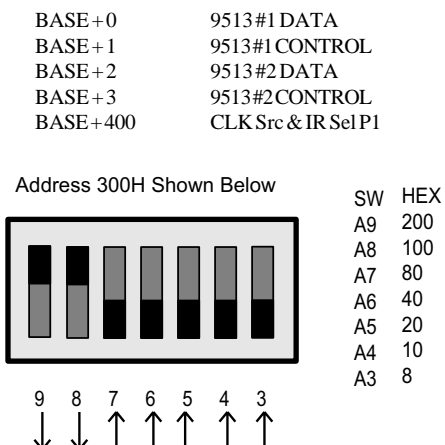
50 PIN CONNECTOR

## I/O REGISTER MAP

The I/O registers of the PC104-CTR10HD occupy 4 I/O locations in the PC's I/O address space. The first, or BASE, address is fixed by the base address switch.

### PC104-CTR10HD

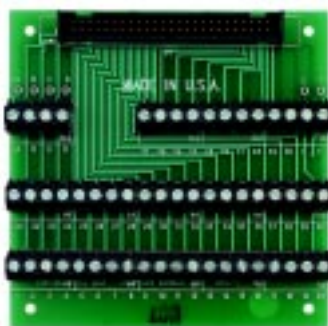
Set BASE address by switching inputs to a comparator. Each switch corresponds to one address line on the PC bus. Each switch represents one address weight and weights are added to determine a unique address.



## ACCESSORIES

Counters work best when the inputs have sharp, clean edges. Often, the signal source is a button or a switch that bounces or glitches, or the signal may be 0-24V or some voltage higher than TTL levels. The CIO-SPADE50 has spade lugs for connecting signal wires to and a prototype area. You can populate the area with circuits to meet the needs of your application.

For economy of space and funds, the CIO-MINI50 provides 12-22 AWG screw termination of all 50 signals, for one half the cost of larger screw terminal boards.



CIO-MINI50

## WHY ISA BOARD COMPATIBILITY?

Register and connector compatibility with our ISA bus boards is important to you for one reason; savings. Because you develop your software and field wiring only once, you save money and time. Isn't that what the PC104 standard is all about?

PC104 CPU cards are expected to run DOS and Windows, work with the BASIC, C and Pascal languages from MicroSoft and Borland and run popular applications programs like Labtech Notebook. Boards with COM and LPT ports are expected to be compliant with the standard COM and LPT drivers built into the operating systems. Everything about PC104 is supposed to reduce your cost of porting and application developed on a standard ISA bus PC to an embedded system.

We believe the I/O boards are part of the promise of PC104. We design our PC104 boards so you can just plug in the board and your existing field wiring, load your proven software, and begin using your new embedded system today. ComputerBoards ISA bus boards are based on industry standard architectures like DAS16, DAS08, CTR05 and DIO24. Our PC104 boards are also.

Don't waste money and time adapting to new I/O board designs. Choose the PC104 boards designed to save you money.

## SPECIFICATIONS

Output Low	0.4V max @ 3.2mA
Output High	2.4V min @ -200uA
Input Low	-0.5V min, 0.8V max
Input High	2.0V min, 7.0V max
Power Consumption	300mA @ 5V Typ, 500mA ax

### PC104-CTR10HD/H50 50ppm XTAL

Order your PC104-CTR10HD board with the suffix "/H50" and it will arrive with a high accuracy 50 part-per-million XTAL in place of the standard 100 ppM XTAL!

## ORDERING INFORMATION

10 Counters (16 bit)	PC104-CTR10HD
Same as above with 50 ppM XTAL	PC104-CTR10HD/H50
4"X 4" Economy Screw Terminal	CIO-MINI50
16" X 4" Spade Lug termination panel	CIO-SPADE50
Cable, 50 Conductor, Female both ends, 2 ft.	C50FF-2
Cable, 50 Conductor, Female, Custom length.	C50FF-##



C50FF-2

High quality screw terminal boards and cables can save you hours of valuable time.